

WHAT IS CLAIMED IS:

1. A light-emitting ceiling tile comprising light-emitting group IV nanoparticles.
2. The light-emitting ceiling tile according to claim 1, wherein the group IV nanoparticles are silicon nanoparticles.
3. The light-emitting ceiling tile according to claim 1, wherein the ceiling tile comprises a ceiling tile substrate and a light-emitting subassembly disposed on the substrate, the subassembly comprising the group IV nanoparticles.
4. The light-emitting ceiling tile according to claim 3, wherein the ceiling tile substrate comprises two opposing flat faces and a perimeter, and the light-emitting subassembly comprises two opposing flat faces and a perimeter.
5. The light-emitting ceiling tile according to claim 3, wherein the light-emitting subassembly comprises a light-emitting layer, wherein the layer comprises the group IV nanoparticles.
6. The light-emitting ceiling tile according to claim 5, wherein the light-emitting layer comprises a binder for the light-emitting group IV nanoparticles.
7. The light-emitting ceiling tile according to claim 3, wherein the light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer which

comprises the light-emitting group IV nanoparticles, a second electrode, and a second electrical insulation layer.

8. The light-emitting ceiling tile according to claim 3, wherein the light-emitting subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer which comprises the light-emitting group IV nanoparticles, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

9. The light-emitting ceiling tile according to claim 7, wherein the first electrical insulation layer and the first electrode layer are substantially transparent to the light emitted by the light-emitting layer.

10. The light-emitting ceiling tile according to claim 1, wherein the tile emits white light.

11. The light-emitting ceiling tile according to claim 3, wherein the light-emitting subassembly comprises an electron barrier layer.

12. The light-emitting ceiling tile according to claim 3, wherein the light emitting subassembly comprises a hole barrier layer.

13. A light-emitting ceiling tile comprising a ceiling tile substrate and a light-emitting subassembly disposed on the substrate, the subassembly comprising light-emitting group IV

nanostructures, wherein the ceiling tile substrate comprises two opposing flat faces and a perimeter, and the light-emitting subassembly comprises two opposing flat faces and a perimeter.

14. The light-emitting ceiling tile according to claim 13, wherein the light-emitting subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer which comprises the light-emitting group IV nanostructures, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

15. The light-emitting ceiling tile according to claim 14, wherein the first electrical insulation layer and the first electrode layer are substantially transparent to the light emitted by the light-emitting layer.

16. The light-emitting ceiling tile according to claim 13, wherein the ceiling tile is adapted to provide contact with a voltage source.

17. The light-emitting ceiling tile according to claim 13, wherein the light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer which comprises the light-emitting group IV nanostructures, a second electrode, and a second electrical insulation layer.

18. The light-emitting ceiling tile according to claim 13, further comprising a reflective layer.

19. The light-emitting ceiling tile according to claim 13, further comprising an electron transport layer and a hole transport layer.
20. A subassembly for use in a light-emitting ceiling tile, the subassembly comprising light-emitting group IV nanoparticles
21. The subassembly according to claim 20, wherein the group IV nanoparticles are group IV silicon nanoparticles.
22. The subassembly according to claim 20, wherein the group IV nanoparticles are core-shell nanoparticles.
23. The subassembly according to claim 20, wherein the group IV nanoparticles are core-shell nanoparticle comprising silicon.
24. The subassembly according to claim 20, wherein the subassembly is adapted to be disposed on a ceiling tile substrate.
25. The subassembly according to claim 20, wherein the subassembly comprises two opposing faces and a perimeter edge.
26. The subassembly according to claim 20, wherein the light-emitting subassembly comprises a light-emitting layer, wherein the layer comprises the group IV nanoparticles.

27. The subassembly according to claim 20, wherein the subassembly comprises a binder for the group IV nanoparticles.

28. The subassembly according to claim 20, wherein the subassembly comprises a first electrical insulation layer, upon which is disposed a first electrode layer, upon which is disposed a light-emitting layer which comprises the light-emitting group IV nanoparticles, upon which is disposed a second electrode, upon which is disposed a second electrical insulation layer.

29. The subassembly according to claim 28, wherein the first electrical insulation layer and the first electrode layer are transparent to the light emitted by the light-emitting layer.

30. The subassembly according to claim 20, wherein the sub-assembly emits white light.

31. The subassembly according to claim 20, wherein the sub-assembly emits colored light.

32. A subassembly for use in a light-emitting ceiling tile, the subassembly comprising a first electrode layer, a light-emitting layer which comprises light-emitting group IV nanostructures, and a second electrode layer, wherein the subassembly comprises two opposing faces and a perimeter edge, and wherein the first electrode layer is transparent to the light emitted by the light-emitting layer.

33. The subassembly according to claim 32, wherein the subassembly is adapted to provide contact with a voltage source.
34. The subassembly according to claim 32, wherein the nanostructures are nanoparticles.
35. The subassembly according to claim 32, further comprising a reflective layer.
36. The subassembly according to claim 32, further comprising an electron transport layer and a hole transport layer.
37. The subassembly according to claim 34, further comprising a reflective layer.
38. The subassembly according to claim 34, further comprising an electron transport layer and a hole transport layer.
39. The subassembly according to claim 37, further comprising an electron transport layer and a hole transport layer.
40. A light-emitting ceiling tile device, comprising:
- a plurality of nanoparticles, the nanoparticles comprising a group IV semiconductor and a capping agent coupled to the group IV semiconductor, wherein the nanoparticles have an average diameter of between about 0.5 nm to about 15 nm; and
 - a first electrode electrically coupled to the plurality of nanoparticles; and

a second electrode electrically coupled to the plurality of nanoparticles;

wherein the first and second electrodes together are configured to conduct an applied current to the nanoparticles, wherein the nanoparticles produce light in response to the applied current.

41. The method of making a light-emitting ceiling tile comprising combining a ceiling tile substrate with a light-emitting subassembly comprising light-emitting group IV nanoparticles so that the subassembly is disposed on the ceiling tile substrate.

42. The method of making a light-emitting subassembly comprising combining (a) a light-emitting layer comprising light-emitting group IV nanoparticles, (b) first and second electrode layers, and (c) first and second electrical insulation layers, wherein the layers (a), (b), and (c) are in laminar arrangement, wherein the first electrode is disposed on the first electrical insulation layer, and the first electrode and the first electrical insulation layer are transparent.

43. Use of the ceiling tile according to claim 1 or 13 for emergency lighting.

44. Use of the ceiling tile according to claim 1 or 13 for in-door lighting.

45. Use of the ceiling tile according to claim 1 or 13 for track lighting.

46. Use of the ceiling tile according to claim 1 or 13 for direct lighting of an airplane interior.

47. A light-emitting tile comprising a tile substrate and a light-emitting subassembly disposed on the substrate, the subassembly comprising light-emitting group IV nanostructures, wherein the tile substrate comprises two opposing flat faces and a perimeter, and the light-emitting subassembly comprises two opposing flat faces and a perimeter.

48. The light-emitting ceiling tile according to claim 47, wherein the nanostructures are nanoparticles.

49. The light-emitting tile according to claim 47, wherein the light-emitting subassembly comprises a first electrical insulation layer, a first electrode layer, a light-emitting layer which comprises the light-emitting group IV nanostructures, a second electrode, and a second electrical insulation layer.

50. The light-emitting tile according to claim 49, wherein the first electrical insulation layer and the first electrode layer are substantially transparent to the light emitted by the light-emitting layer.

51. The light-emitting ceiling tile according to claim 47, wherein the tile is adapted to provide contact with a voltage source.